

## CLAIMS

1. A process for synthesising hydrocarbons from a mixture comprising carbon monoxide and hydrogen in the presence of a catalyst comprising at least one group VIII metal supported on a silica-alumina prepared by co-precipitating and calcining at a temperature in the range from about 500°C to about 1200°C for at least 6 hours such that said silica-alumina has a specific surface area of less than 260 m<sup>2</sup>/g.
2. A process according to claim 1, in which the silica alumina support is prepared by bringing at least two solutions into contact under controlled operating conditions and co-precipitation, drying with forming then calcining.
3. A process according to claim 1, in which the silica alumina support is prepared by precipitation of an alumina hydrogel then in which the mixed silica alumina hydrogel is obtained by adding a solution of silicic acid, intense homogenisation by vigorous stirring, shearing, colloidal milling, drying with forming then calcining.
4. A process according to claim 1, in which in a first stage, an aqueous solution of silicic acid is prepared by decationisation of a water-soluble alkaline silicate, then in which this solution is brought into contact with an aqueous solution containing at least one cationic aluminium salt, and in which the aqueous solution obtained is co-precipitated with ammonia under controlled operating conditions.
5. A process according to claim 1, in which in a first stage, an aqueous solution of silicic acid is prepared by decationisation of a water-soluble alkaline silicate, then in which this solution is simultaneously brought into contact with a non aqueous solution of at least one aluminium alkoxide and with water, under controlled operating conditions, to hydrolyse said alkoxide by incorporating the silica simultaneously therein, then in which the aqueous suspension obtained is homogenised by intense agitation, then dried and formed by spray drying.
6. A process according to claim 1, in which in a first stage, an aqueous solution of silicic acid is prepared by decationisation of a water-soluble alkaline silicate, then in which this solution is brought into contact with the hydrolysis product of

at least one aluminium alkoxide, and in which the aqueous suspension obtained is homogenised by intense agitation, then dried and formed by spray drying.

7. A process according to any one of claims 3 to 6, in which homogenisation is carried out by ultramilling in a colloidal mill.
- 5 8. A process according to any one of claims 1 to 7, in which the silica-alumina is calcined at a temperature in the range 700°C to 1200°C for at least 10 hours.
9. A process according to any one of claims 1 to 8, in which the silica-alumina is initially calcined at a temperature in the range of 350°C to 550°C for at least 1 hour, then at a temperature in the range of about 500°C to about 1200°C for at least 6 hours.
- 10 10. A process according to any one of claims 1 to 9, in which the silica-alumina is homogeneous on the micrometre scale.
11. A process according to any one of claims 1 to 10, in which the silica-alumina is homogeneous on the nanometre scale.
- 15 12. A process according to any one of claims 1 to 11, in which the amount of anionic and cationic impurities is less than 0.1% by weight.
13. A process according to any one of claims 1 to 12, in which the silica-alumina contains 0.5% to 30% by weight of silica with respect to the anhydrous product.
14. A process according to any one of claims 1 to 13, in which the group VIII metal content is in the range 0.1% to 50% by weight.
- 20 15. A process according to any one of claims 1 to 14, in which the group VIII metal is cobalt.
16. A process according to any one of claims 1 to 15, in which the catalyst contains at least one additional element selected from the group formed by: ruthenium, molybdenum, tantalum, platinum and palladium.
- 25 17. A process according to any one of claims 1 to 16, in which the catalyst further contains 0.1% to 5% by weight of at least one oxide  $M_2O_3$  of at least one metal M selected from the group formed by lanthanum, praseodymium and neodymium.
- 30 18. A process according to any one of claims 1 to 17, in which the catalyst is used in suspension in a liquid phase, in a three-phase reactor.

19. A process according to claim 18, in which said catalyst is in the form of a powder with a grain size of less than 800 microns.
  20. A process according to any one of claims 1 to 17, in which the catalyst is used in a fixed bed in the form of particles with an equivalent diameter in the range 2 to 10 mm.
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